

REMARKS

Further and favorable reconsideration is respectfully requested in view of the foregoing amendments and following remarks.

Claims 1-3, 5, 7 and 8 were pending in this application when examined.

Entry of the amendments is proper under 37 CFR §1.116, because the amendments place the application in condition for allowance, do not raise any new issue requiring further search and/or consideration and do not present any additional claims without cancelling a corresponding number of finally rejected claims. The amendments are necessary and were not earlier presented, because they are made in response to arguments raised in the final rejection. Entry of the amendments is thus respectfully requested.

Claim 1 has been amended to recite that the cyclic ester comprises “glycolide or a mixture of glycolide and lactide containing 70 wt.% or more of the glycolide” from claim 3 and from paragraph [0015] of the specification. Claim 1 has also been amended to recite “after the polymerization, the aliphatic polyester is pelletized together with a thermal stabilizer” from claim 7.

As a result, of the amendments to claim 1, claims 3 and 7 have been cancelled without prejudice or disclaimer.

Support for new claim 10 can be found in paragraph [0032] of the specification.

I. Claim Rejections Under 35 U.S.C. § 103

The Examiner rejects claims 1-3, 5 and 8 under 35 U.S.C. § 103(a) as being unpatentable over DeProspero (U.S. 3,565,869) in view of Terado et al. (U.S. 6,528,617); and rejects claim 7 under 35 U.S.C. § 103(a) as being unpatentable over DeProspero in view of Terado et al. as applied to claims 1-3, 5 and 8 above, combined with Yamane et al. (U.S. 2003/0125431). As applied to the amended claims, Applicants respectfully traverse the rejections.

As discussed in Applicants' previous response, the presently claimed process is as an industrially feasible process for producing a glycolic acid (co)polymer with a reduced residual monomer content of below 0.2 wt.%.

Claim 1 has been amended to recite that **the cyclic ester comprises “glycolide or a mixture of glycolide and lactide containing 70 wt.% or more of the glycolide”**; and that “after the polymerization, the aliphatic polyester is pelletized together with a thermal stabilizer,

and then contacting the pelletized aliphatic polyester with a flowing heated dry gas under normal pressure”.

Accordingly, the process of amended claim 1 limits the cyclic ester to glycolide or a glycolide-rich mixture of glycolide and lactide, and requires pelletization of the aliphatic polyester **after** the polymerization with a thermal stabilizer, **but before** the final cyclic ester reduction step of **contacting the pelletized aliphatic polyester** with a flowing heated dry gas under **normal pressure**. Thus, the process of amended claim 1 produces a glycolic acid (co)polymer with a reduced residual monomer content of below 0.2 wt.%. DeProspero, Terado et al. and Yamane et al. do not teach or suggest the process of amended claim 1.

As discussed in Applicants’ previous response, the DeProspero reference discloses the application of **severe** gas-phase monomer removal conditions (i.e., contact with a heated dry gas **under a reduced pressure**) to impure solid polyglycolic acid containing as much as 8 wt.% of residual monomer (see column 1, line 56, column 3, lines 34-44, column 5, lines 28-29 and claim 1 of the reference). However, claim 1 of the present application requires “contacting the pelletized aliphatic polyester with a flowing heated dry gas **under normal pressure**”.

In item 5 on page 5 of the Office Action, the Examiner asserts that Applicants have admitted that their process is less effective than the process disclosed in the reference, but that the claimed process is safer. First of all, “normal pressure”, as recited in the process of claim 1, is much safer than a reduced pressure process, because the likelihood of an explosion in an apparatus containing and processing combustible materials by the introduction of atmospheric oxygen into the apparatus can be minimized. Thus, the claimed process is industrially feasible because it is much safer than a process using gas under a reduced pressure.

Furthermore, a glycolic acid (co)polymer treated by the presently claimed process is thermally unstable compared with the other aliphatic polyesters, even in its solid state. In order to minimize the residual monomer by contact with a flowing heated dry gas under normal pressure, which is safe although admittedly not as efficient for monomer reduction, **after the polymerization, the glycolic acid (co)polymer is pelletized together with a thermal stabilizer to minimize the de-polymerization in the monomer reduction step**. Thus, further pelletization of the aliphatic ester together with a thermal stabilizer **after polymierization**, and then contacting the pelletized aliphatic polyester with a flowing heated dry gas under normal pressure, would not have been obvious over the DeProspero reference.

Terado et al. also do not teach or suggest “after the polymerization, the aliphatic polyester is pelletized together with a thermal stabilizer, **and then** contacting the pelletized aliphatic polyester with a flowing heated dry gas under normal pressure”, as recite in amended claim 1. The reference is principally directed to post-treatment of polylactic acid using a volatile catalyst, such as an organic sulfonic acid.

Accordingly, claim 1 would not have been obvious over DeProspero in view of Terado et al.

Yamane et al. do not teach or suggest “after the polymerization, the aliphatic polyester is pelletized together with a thermal stabilizer, **and then contacting the pelletized aliphatic polyester with a flowing heated dry gas under normal pressure**”.

As has been pointed out by the Examiner, the reference discloses that the addition of a thermal stabilizer to crystalline polyglycolic acid provides a polyglycolic acid composition having modified thermal properties and improved melt stability (paragraph [0021] of the reference). The modified thermal properties refer to an increase ($T_2 - T_1$) in temperature causing 3% weight loss (paragraph [0020] of the reference). However, the temperature (T_2) of the modified composition is over 310 °C (compared with $T_1 = 304.7$ °C for non-modified polyglycolic acid), as represented by Run Nos. 6-1 to 6-7 in Table 4 in paragraph [0162] of the reference). This is much higher than the melting point (T_m) of about 220 °C (see paragraph [0018] of the reference).

Thus, Yamane et al. disclose improved properties in the molten state by the addition of a thermal stabilizer, but do not teach or suggest improved thermal stability in the solid state by the addition of a thermal stabilizer leading to an improved monomer reduction in glycolic acid (co)polymer “and then contacting the pelletized aliphatic polyester with a flowing heated dry gas under normal pressure”, as recited in claim 1.

Accordingly, the process of claim 1, including the combination of solid-phase polymerization of glycolic acid (co)polymer which takes advantage of a favorable polymerization equilibrium, and a subsequent monomer reduction step of contacting the pelletized glycolic acid (co)polymer containing a thermal stabilizer with a flowing heated dry gas under normal pressure, would not have been obvious over DeProspero, Terado et al. and Yamane et al.

Therefore, claim 1 would not have been obvious over the references.

Claims 2, 5, 8 and 10 depend from claim 1, and thus also would not have been obvious over the references.

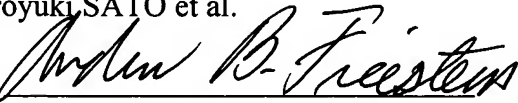
II. Conclusion

For these reasons, Applicants take the position that the presently claimed invention is clearly patentable over the applied references.

Therefore, in view of the foregoing amendments and remarks, it is submitted that the rejections set forth by the Examiner have been overcome, and that the application is in condition for allowance. Such allowance is solicited.

Respectfully submitted,

Hiroyuki SATO et al.

By 

Andrew B. Freistein
Registration No. 52,917
Attorney for Applicants

ABF/acs
Washington, D.C. 20005-1503
Telephone (202) 721-8200
Facsimile (202) 721-8250
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